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## **Cover Page Footnote**

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## Using a data-driven organizational improvement model to engage an interdisciplinary team in transforming a public women's health clinic

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### Abstract

Gouverneur Health is the largest diagnostic and treatment center in New York State, and part of the New York City Health and Hospitals Corporation (HHC), a public benefit corporation with \$6.7 billion in annual revenues. HHC is the largest municipal healthcare system in the United States serving 1.4 million patients, including more than 475,000 uninsured city residents.<sup>1</sup> Within Gouverneur, the Women's Health department is committed to providing high quality services that improve patients' health and wellbeing, yet patient experience, flow, clinic access and education are in need of process improvements. To enhance patient experience and identify strategies replicable for other departments, an interdisciplinary 15-member team used an organizational improvement initiative known as a Breakthrough Value Stream Analysis (VSA) to analyze and improve a series of clinical and operational processes. Breakthrough is an organizational improvement model that HHC created in 2007 in collaboration with Simpler Consulting.

### Keywords

Healthcare administration, process improvement, women's health, obstetrics, gynecology

### Introduction

The Women's Health department treats approximately 1,600 patients per month through approximately 2,100 visits. Patients are culturally diverse and largely low-income: approximately 41% are Latina, 31% are Asian, and 46% of the patients are uninsured. Providers in Women's Health are all bilingual, speaking Spanish, Mandarin and/or Cantonese as well as English.

To enhance patient experience and identify strategies replicable for other departments, an interdisciplinary 15-member team used an organizational improvement initiative known as a Breakthrough Value Stream Analysis (VSA) to analyze and improve a series of clinical and operational processes. In preparation for the VSA, data was collected for three months leading up to the event. Retrospective data collection and analysis was performed using patient information software systems (Soarian 3.4, Press Ganey, and Ahlers). Additional data was drawn from staff interviews, direct observation, an online staff satisfaction survey (n=19) and a verbally administered patient satisfaction survey (n=50). (For additional detail, see Table 1).

The VSA successfully created a vision for a dynamic patient-centered, team-based approach optimizing the patient care experience. The team identified the following

data-driven improvement projects to be carried out within an 8-month period: streamlined registration process to move patients directly into their exam rooms, care teams and provider templates built to support patient continuity, efficient process for serving urgent needs patients, and technology harnessed to facilitate patient focused care team mobility throughout the clinic.

### Quality Improvement at the New York City Health and Hospitals Corporation

Breakthrough is a patient-centered organizational improvement model that New York City Health and Hospitals Corporation (HHC) created in 2007 in collaboration with Simpler Consulting. The goal of Breakthrough is to improve staff and patient satisfaction while simultaneously reducing waste and streamlining processes throughout the organization.<sup>2</sup> Since HHC adopted Breakthrough, it has become the central method of problem solving and process improvements in HHC's facilities, which are located in all five boroughs of New York City. Breakthrough operates on two fundamental beliefs: continuous improvement and respect for people. With these principles in mind, Breakthrough activities engage staff members involved in the processes to devise strategic improvements.

**Table 1. Pre-Event Data Collection**

Data Point	Source of Data
Appointment Fill Rate (%)	Report from Gouverneur’s electronic scheduling system combined with manual tracking of individual provider schedules
Appointment No Show Rate (%)	Report from Gouverneur’s electronic scheduling system combined with manual tracking of individual provider schedules
Monthly Visit Count	Report from HHC’s central office
Patient Satisfaction	Report from the Press Ganey patient satisfaction survey
Gynecology patient retention rate	Report from Gouverneur’s central data warehouse
Prenatal patient retention rate	Report from Gouverneur’s central data warehouse
Total patient flow time	Staff observation of patient flow time
Insured patients (%)	Report from Gouverneur’s finance department
Staff engagement	% of staff who have participated in one or more Breakthrough events
Staff satisfaction	Anonymous survey emailed to staff

The Breakthrough principles are based on the Toyota Motor Corporation’s production efficiency process known as “Lean,” which aims to increase organizational efficiency while reducing costs. By creating a more efficient organization, Lean helps organizations better serve their customers. Through Lean, front-line staff members are encouraged to devise and implement solutions to problems. Ideally, solutions developed in one department can then be adopted by other areas of the organization. At HHC, Breakthrough has enabled organizational improvements including:

- Referral system that ensures patients receive the appropriate follow-up care, leading to saved time and money for both patients and staff
- Increased revenue, helping to ameliorate financial challenges
- Centralization of the inventory storage area, saving clinical staff time previously spent looking for supplies.<sup>2</sup>

Breakthrough is also based on the principles of “6 Sigma,” a quality improvement method that originated from manufacturing companies such as Motorola and GE. 6 Sigma aims to standardize a process and reduce errors by

following a process known as the acronym, DMAIC<sup>3</sup>.

The DMAIC process involves the following steps:

- (1) Define the opportunity
- (2) Measure the baseline performance
- (3) Analyze the root causes
- (4) Improve the process
- (5) Control the improved process to prevent regression<sup>3</sup>

**Breakthrough Project: Value Stream Analysis (VSA)**

In Breakthrough, a Value Stream refers to a set of activities involved in delivering a service to the customer. In a Value Stream Analysis (VSA), a carefully selected team, comprised of 1/3 staff involved in the actual process, 1/3 suppliers/services that support the process and 1/3 “fresh eyes,” or individuals who are not directly involved in the process, convenes for 4.5 days to identify each of those activities and reveal waste, uneven distribution of work, and areas for improvement. During the data collection process, team members collect information that reflects the patient experience. After the team identifies and analyzes the activities, they strategize an action plan to improve the service, and create customer-defined value.

The outcome of the VSA is a plan for deploying a series of Rapid Improvement Events (RIEs), each of which targets a set of activities within the value stream for improvement. Each RIE convenes a team whose members have unique expertise in the relevant areas. RIE team members can be anyone with helpful insight, and can range from hospital executives to medical assistants to administrative staff. The voice of the customer is represented through collecting data about customer satisfaction, or through feedback of team members who interact closely with patients. Teams work for 4.5 days to devise and carry out an action plan to improve a process. The goal is for a successful series of RIEs to achieve goal metrics in the Target State that were identified in the VSA.

The VSA is structured similarly to the Lean methodology’s A3 process. The team analyzes processes through the following steps: (1) Reason for Action, (2) Initial State, (3) Target State, (4) Gap Analysis, (5) Solution Approach, (6) Rapid Experiments, (7) Completion Plan, (8) Confirmed State, and (9) Insights.

Each day of the VSA follows a structured analysis and brainstorm process facilitated by a staff member with Breakthrough methodology expertise. Each day closes with a review of the day’s insights, where team members can share ideas, or thoughts for improving the process. They can also write ideas outside of the scope of the VSA on a Post-It and add it to a paper “Parking Lot” to be addressed at a later time.

During Day 1 of the VSA, the team maps the department's "current state" on a large piece of butcher paper, showing high-level processes and naturally formed groups. The goal of this visual is to identify which steps in a process can be eliminated or combined. The team also does a "Gemba walk," during which they walk through the physical area that is the focus of the VSA, and note any forms of waste (including wasted materials, time and skills) that could negatively impact the patient experience. The Gemba walk also enables the team to experience the process through the eyes of the staff members and patients.

During Day 1, the team also reviews the "current state" data that was collected in the weeks preceding the event. Key data points are listed in Table 1.

Day 1 also includes creation of the "Spaghetti Diagram" and "Hand-off Chart," which pictorially demonstrate how often patients are moved from place to place, and handed off between staff members, during a visit. The Spaghetti Diagram is drawn by half of the team over a floor plan of the clinic, and shows where staff and patients move throughout the clinic during a visit. The Hand-Off Chart is drawn by the other half of the team on a circle on a large piece of paper. On the circle, the team notes patient handoff moments. Lines are then drawn across the circle to illustrate where patients go after each handoff; different colors are used to depict different patient processes (e.g. a new patient visit versus a revisit patient). The goal of these visuals is to identify bottlenecks in the patient flow, unnecessary steps in clinic processes, and which steps can be combined to create more efficient processes. A robust discussion is facilitated among team members of how a patient's movements throughout her visit affect her experience.

During Day 2, team members conceptualize their target state, and set goals to be achieved within 12 months. They also list barriers and gaps to achieving the target state, rate each item on the likelihood that it will be achieved over the next 12 months, and then focus on the items that the team has identified as having 75%-100% control over.

During Day 3, team members analyze the gap between the current and target states, and identify barriers to reaching the target state. They also create an action plan composed of rapid improvement experiments (RIEs). Each RIE will require a new interdisciplinary team and a separate week of brainstorming, analysis and implementation. Each RIE also has a "process owner," who takes responsibility for the department achieving the RIE's goals. Finally, the team identifies opportunities for departmental projects (discrete improvement initiatives that are carried out by a smaller group of people than the RIE, and during less structured times) and just-do-it's (tasks that stakeholders are asked to simply do, without further analysis or action).

On Day 4, team members assign "process owners" to the RIEs, write charters for each experiment outlining the reason for action, metrics of success and projected timeframe, and complete any unfinished activities. On Day 5, team members review the week and report out to organizational leadership.

### Reason for Action

The Department of Women's Health at Gouverneur is committed to providing a wide range of high quality services that improve the health and wellbeing of female patients. Yet, due to current operational challenges, the patient experience, access, flow, and education are hampered. Without optimized patient experience, clinical outcomes and revenue may not reach their full potential.

The Department is staffed by seven physicians, one nurse practitioner, one certified nurse midwife, six nurses and nine patient care associates (PCAs). The Department is open on Saturdays as well as two evenings per week. One afternoon per week, a maternal fetal medicine specialist joins the practice to treat high-risk prenatal patients, including those with gestational diabetes. The Department shares its floor with the Departments of Pediatrics, Dentistry and the Women, Infants and Children (WIC) program.

Gouverneur leadership hypothesized that by improving the patient experience, the following goals would be achieved: (1) retain current patient population, (2) optimize the Affordable Care Act by attracting new patients who are insured, (4) increase revenue per visit by increasing revenue per provider, and (3) decrease operational expenses. The overarching goal of the VSA is to improve and enhance the patient experience in Women's Health through improving flow, beginning at patient registration and ending at patient discharge.

### Initial State: Which Metrics Can Be Used to Portray the Patient Experience?

Data on the current state of Women's Health was collected for three months preceding the event. Retrospective data collection and analysis was performed using multiple patient information software systems (Soarian 3.4, Press Ganey, and Ahlers). Additional data was drawn from staff interviews, direct staff observation, an online anonymous quantitative staff satisfaction survey (n=19) and a verbally administered quantitative and qualitative patient satisfaction survey (n=50) based on a survey developed by the U.S. Department of Health and Human Services' Health Resources and Services Administration.<sup>4</sup> For the list of key initial state data, see Table 2. For an overview of the patient satisfaction survey, see Table 3.

**Table 2. Initial State Data**

Timeframe	Initial State Metric	Value
<b>Q1 2014</b>	<b>1st next available appointment (days)</b>	
	New appointment	2
	Revisit appointment	2
<b>Q1 2014</b>	<b>3rd next available appointment (days)</b>	
	New appointment	3
	Revisit appointment	3
<b>Q1 2014</b>	Fill rate (% of appointments filled)	86%
<b>Q1 2014</b>	Productivity rate (# of patients seen per provider per hour)	2.3
<b>Q1 2014</b>	No-show rate	28%
<b>Q1 2014</b>	# of walk-in patients/week	24
<b>Q1 2014</b>	Monthly visit count	2124
<b>Q1 2014</b>	Total unique patients seen/month	1595
<b>Q1 2014</b>	Patient satisfaction score for "Overall" rating	82%

The patient satisfaction survey was administered in English, Spanish, Cantonese and French, to ensure patients from diverse cultural backgrounds were represented. Over a period of one week, researchers approached patients waiting for their appointments in the afternoons and mornings, in order to include patients seen by a variety of providers in the clinic for a variety of services.

The “1<sup>st</sup> next available” data point shows how long a patient calling into the practice has to wait for the first next available appointment. The “3<sup>rd</sup> next available” data point shows how long a patient calling into the practice has to wait for the 3<sup>rd</sup> next available appointment. Both measures are taken to ensure the reported wait times are valid.

Initial state data painted the following overall picture of the patient experience in Women’s Health: While it is easy to gain access into the Women’s Health service, it is not easy for patients to then obtain a follow-up appointment with their provider of choice. This presents challenges to maintaining patient-provider continuity. Additionally, a suboptimal scheduling system contributes to difficulty in finding specific appointment types within an appropriate time frame.

### **Target State: Goals for Optimized Patient Experience**

Based on the initial state data and knowledge of achievements of other departments within Gouverneur and at other HHC facilities, the team set goals for the improvement processes to be carried out in the months

following the VSA. The overall goals of the target state were to meet patient demand, increase departmental growth, improve patient access, provide quality care to patients within their requested timeframe, increase patient retention, improve HPV vaccination rates and improve the percentage of patients enrolled in the family planning program. Targets were set during team discussion of what goals would both push the department to strive to meet higher standards and would also be achievable. For the full list of target state metrics, see Table 4.

These metrics align with the HHC’s guiding principles, known as “True North Metrics.” The True North Metrics are:

- (1) Support human development by improving capability at all levels
- (2) Produce high quality by eliminating defects
- (3) Provide timeliness by offering services in sequence, on demand
- (4) Optimize cost by ensuring 100% of services provide “value add” to the patient
- (5) Increase growth and capacity by caring for more people

### **Gap Analysis: What Factors Impede Patient Service?**

A range of factors impede achievement of our current state. Due to the technological limitations of the clinic and the way in which the patient flow has evolved, patients are moved from room to room during their visit as they have their vitals taken by the medical assistant, wait for their provider, see their provider, wait for their nurse, see their nurse and are discharged. The Press Ganey-measured

**Table 3. Patient Satisfaction Survey (n=50)**

Ease of getting care	
Average Score	3.67
Highest Score	Clinic's location
Lowest Score	Timeliness of questions answered by phone
Time Spent Waiting	
Average Score	3.3
Highest Score	Time spent in waiting room
Lowest Score	Time spent waiting for test results
Provider	
Average Score	4
Highest Score	Listens to patient
Lowest Score	Spends enough time with patient
Nurse/Medical Assistant	
Average Score	4.32
Highest Score	N/A
Lowest Score	N/A
Quality of Care	
Average Score	4.11
Highest Score	Quality of care received
Lowest Score	Patient understands health information
Front Desk Staff	
Average Score	4.02
Highest Score	N/A
Lowest Score	N/A
Facility Overall	
Average Score	4.36
Highest Score	Privacy in exam room
Lowest Score	Ease of finding where to go
Confidentiality Maintenance	
Average Score	4.28
Highest Score	N/A
Lowest Score	N/A
Likelihood of Referring Others	
Average Score	4.38
Highest Score	N/A
Lowest Score	N/A

\* Ratings: 5=great, 4=Good, 3=Okay, 2=Fair, 1=poor. Topic areas that only had two metrics were marked "N/A" for highest and lowest scores.

**Table 4. Target State Metrics**

Metrics	Current	Target
Press Ganey Score (in "Standard Overall" rating)	82%	89%
Gynecology Patient Retention Rate	77%	85%
Prenatal Patient Retention Rate	85%	90%
Total Flow Time	83 minutes	71 minutes
% of Insured Patients	54%	60%
Staff Satisfaction	79%	100%

metric “moving through your visit” has continuously been one of the clinic’s lowest scores.

Patients are obstructed from accessing their provider of choice in a timely manner due to heavy patient demand and non-optimized provider templates. This leads to long wait time for certain providers’ services, while other providers are accessible within one to two days. Additionally, certain appointment types are readily available while others have long wait times. As a result, patients switch back and forth between providers, interrupting patient-provider continuity. Patients also may be prevented from seeing a provider who speaks their native language, impeding provider-patient communication.

Patients with urgent needs are confronted with several issues. Obtaining a same-day appointment may be difficult due to provider schedules that are fully or nearly booked. Patients who arrive past the 30-minute allowed lateness but who have urgent needs are not always able to be moved to another appointment in that day’s schedule. Patients who call with an urgent need may have difficulty reaching a staff member in a timely manner due to clinical staff being occupied treating patients who are physically in the clinic.

Inventory and supply management is suboptimal due to a re-order system that relies on clinical staff members to remember to notify administrative staff in advance when inventory and supply are running low.

While checking in, patients may be required to undergo a lengthy financial evaluation in order to register or re-register as a patient. This can delay the patient from being checked in for her appointment, resulting in a missed appointment slot and longer wait time for the patient. When patients have completed their appointment, they may face a lengthy and cumbersome discharge process. This is because payment, referrals and next appointment making may all be handled by a different staff member,

which requires the patient to navigate between staff members as she is discharged.

### **Solution Approach: What Steps Will Optimize the Patient Experience?**

In order to reach our target state, the VSA team considered the full breadth of data reviewed and discussions had during the VSA, including patient surveys. The team then worked collaboratively to design a series of Rapid Improvement Experiments (RIEs), as well as a series of simpler projects, that will target each of the identified areas for improvement. Since conversations during the VSA were documented by facilitators and displayed using Post-Its, butcher paper, and other display items, team members were able to consult both the data and the team-driven dialogue while designing the RIEs and projects.

The goals of the RIEs and projects are as follows:

- A streamlined registration process to move patients directly into their exam rooms.
- Care teams built to address patient wishes related to continuity.
- Provider templates updated to optimize provider-patient continuity.
- An efficient process created for serving the Urgent Needs patient.
- Technology harnessed to facilitate patient focused care team mobility throughout the clinic.
- A free pregnancy-testing program optimized by creating a provider-supported, patient-controlled process with the goal of increasing patient satisfaction.
- A comprehensive gynecologic assessment for patients electing to continue with their pregnancy before embarking on their prenatal journey.
- Optimized profitability through renewed coding training and processes.

### **Completion Plan: How Will We Achieve VSA-Defined Objectives?**

Our objectives will be achieved through several methods. First, a centrally located Visual Management Board (VMB) will be created to track progress towards the goals of the VSA. Second, a VSA Steering Committee, composed of staff members from different parts of the organization and originally convened before the VSA began, will regularly meet with VSA leadership to discuss progress towards goals and make improvement suggestions. Third, target “check points” are set for the department to analyze its progress towards goals, and once goals are achieved, its success in maintaining those goals.

### **Confirmed State: How Will We Know Our Objectives Have Been Achieved?**

Comprehensive data will be collected before each RIE to capture the initial state of each discrete area. Each RIE team will then set target state metrics for that RIE. After the implementation of each RIE, data will be collected after 30, 60 and 90 days to see if the target state has been achieved. Data will be collected on the same schedule after the VSA.

### **Insights: What Has Our Team Learned?**

Among the most valuable exercises of the VSA was the creation of the Spaghetti Diagram and the Handoff Diagram. Half of the VSA team created the Spaghetti Diagram, which mapped patient movement during one visit on a clinic floor plan. The other half of the VSA team created the Handoff Diagram, which mapped how often patients were moved between staff members. When staff viewed patients’ movements pictorially, it brought a new understanding to how often patients were required to move during an appointment, and prompted planning of an RIE to change clinic flow so that the patient remains in one exam room while clinical staff members all come to her.

### **Conclusion & Next Steps**

The Women’s Health VSA successfully created a vision for a dynamic patient-centered, team-based approach optimizing the patient care experience. This model supports patient-provider continuity and seamless flow through arrival, care team encounter, and discharge.

This paper will be the first in a series that describe process improvements in Gouverneur Health’s Women’s Health department. Subsequent papers will describe each RIE carried out as a result of the VSA, and will present data showing the impact of each RIE on the Department. Implementation of strategies that work will be described

so that other clinics may import aspects that may benefit their own patient populations.

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